Neurometrical Effect of The Folklore Therapy — Hot *Miso* — Compress

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1. Introduction

The hot compress by the use of *Miso* is a time-honoured folklore therapy in Japan and is now widely applied to various diseases with some extent of success.

The physiological effect of this remedy has been attributed to the activation of intestinal function.

One of the present authors, Koda, has deduced his own conclusion from his clinical experience of treatment of serious diseases such as atopic dermatitis, chronic hepatitis, diabetics, malignant tumors, myotonic dystrophy and chronic nephritis, that the excretion of *shukuben* is one of the most important factor to normalize the function of body tissues, thus ultimately leading to the improvement of and recovery from various diseases.

In the process leading to the excretion of *Shukuben*, the activation of intestinal peristalsis is necessary and one of the effective remedies for this is miso-compress.

It has been well-known that hot *miso*-compress, when applied to abdomen, activates the peristalsis of intestine and thus normalizes the intestinal functions.

The present paper deals with the results obtained for the physiological effect of trial *miso*-compress product, which was made in

accordance with the conventional folklore *miso*-compress, as found chiefly by means of neurometry, the change in blood flow and blood circulation.

2. Method

2—1 Trial product of *miso*-compress and its test application.

The trial product was prepared after the conventional *miso*-compress, in which commercial *miso* was plastered in a thin film onto the heating unit containing reduced iron powder to give off heat at exposure to air.

The whole body was wrapped with a porous film and was sealed in a airtight sack for storage.

In the test application, the *miso*-compress was set over the abdomen centering about the navel of human subject, and was fastened tight with a supporter.

2—2 Method of measurement

All the clinical measurements were carried out on the subject who was kept quiet at the room temperature of 25°C for 10 minutes.

2—2—1 Neurometer

A neurometer-D-602 (*Neuro Medical Industry Co. Ltd.*) attached with NEC 9801RX was employed and the measurement values were obtained at 12 representative spots of *Ryoudouraku* in the usual way.

The values obtained were then converted into the index¹⁾ to compare the changes in a time series.

2—2—2 Rumbling noise due to intestinal peristalsis

Rumbling noise due to intestinal peristalsis was recorded with a multipurpose pen-recorder through LA210-noise-meter (*Ono Sokki Inc.*), into which the noises were input from the sound-terminal of the home-made sound collector incorporated with a tethoscope-modified pin-microphone. The intensity was given in decibel unit dB.

2-2-3 Acceleration pulse wave meter

A acceleration pulse wave meter 15000A (*Plethysmographic*) was engaged for measurements.

The subject was kept quiet for 10 minutes and then the measurements were carried out 3 times in succession, keeping the finger of the subject in sedentary orientation at about the height level of heart, and setting the apparatus on the finger.

2-2-4 Blood flow meter

A laser doppler blood flow meter was used for the direct, successive and non-invasive measurement of capillary, and the results obtained were given in % based on 10 V/Gain (100%).

2-3 Subject

Two healthy male subjects were tested, one (subject No.1) of 30 year and another (subject No.2) of 27 year of age.

3. Results

3-1 Change in neurometry

As of subject No.1, neurometrical measurements were taken at 7 points, before application of *miso*-compress, 1-, 2-, 3-, 4-weeks' applications, and further 1-, and 2-weeks interruption after the 4-weeks' application.

Figure-1 shows the changes observed at H2, H3, F1, F2, and F5, out of the change of trinomial repeated moving average at 12 *Keiraku* spots.

The same holds for Subject No.2 as well, namely, the hot compress was applied for 5 weeks and then interrupted after the period.

Of the change of trinomial repeated moving average at 12 *Keiraku* spots, at measured values at H1, H4 and H6 in which effective adaptation was observed, were shown in Figure-2, while in Figure-3 were given those at H2, H3, F1, F2 and F5 which showed the peaks surmising the rebound.

In order to compare each data, the ratio was computed for each measurement value based on the physiological range arbitrarily set up from +100 to -100, and were allotted to each *Keiraku* original form.

3—2 Change in blood flow and intestinal peristalsis noise

In figure-4 were shown the changes in blood flow and intestinal peristalsis noise in succession when *miso-compress* was applied for 4 hr. in subject No.2.

The changes of intensity and frequency in blood flow ratio when the *miso-compress* was applied for successive 5 weeks were given Figure-5, where the intensity of blood flow ratio was in the ratio of peak height relative to its base line of blood flow ratio.

3—3 Change in acceleration pulse wave

Shown in Figure-6 are the changes of acceleration pulse wave when the *miso-compress* was applied to subject No.1 for successive 4 weeks.

In this case, the application of *miso-compress* was interrupted after 4 weeks and then measurement was kept on for further 3 weeks.

4. Discussion and concluding remarks

4—1 It is troublesome for the contemporary moderners to use the conventional folklore *miso-compress* as such and so, we prepared an improved trial product of *miso-compress* of their convenient usage, the physiological effect and clinical efficacy of which were examined by its application.

The time-honoured physiological effect of *miso-compress* are represented by febrifuging, promoting stools, easier breathing, urinating and absorbing ascites, so that the diseases for which this therapy is efficacious are peristalsis, apoplexy, pulsy, ascites and pulmonary tuberculosis.

The clinical experience hitherto obtained indicated a remarkable improvements in chronic hepatitis, liver cirrhosis and Banti diseases as

well and, new application of *miso*-compress may possibly be widened further in various modernization disorders.

The *miso*-compress seems to have historically originated from heat therapy in principle.

The medical efficiency of *miso* easily accessible for use has been found in the course of development of therapy and has been popularized among people through out the country as recorded in history, and its widely accepted efficacy appears to be responsible for the nowadays' popularity firmly rooted in peoples.

4—2 For a better understanding of the change of neurometry on up the test application of *miso*-compress, the change of trinomial repeated moving average at *Keiraku* original form in subject No.1 was shown in Figure-1.

Thus, subject No.1 of normal health has no trouble in *Keiraku*, but it may be safely pointed out that both the suppressing trend of autonomic nerve system at H2, H3, and stimulating trend at H5 and F3 were adjusted for 4 week's application of *miso*-compress (Figure-1), which lasted further for 1 week, and then upon ceasing the application, the trend shows a return to the original point.

In this case, therefore, it appears to need more time of application for autonomic nerve system to be modulated to last longer, showing no return.

In case of subject No.2 is also of normal health and has no trouble at *Keiraku*.

Interpretation of the graph indicates 4 patterns as follow:

- 1) The definite changes within the physiological range (H5, F3)
- 2) The stimulating trend of autonomic nerve system which is continuously modulated for further 1~2 weeks after 5 week's application at F4 and F6

3) The stimulating or suppressing trend is adjusted after 5 week's application, keeping the change at a definite level (H1, H4 & H6) (Figure-2)

4) A peak appears (Fig. 3) at 3 week's application period and, then, trend to return the original point (H2, H3, F1, F2 & F5)

The comparison of subjects No.1 with No.2, which shows specific similarity in the pattern of change, suggests that *miso-compress* exerts a delicate difference in efficacy for respective person.

It may be summarized that the long-lasting application of *miso-compress* appears to bring about the adjustment of autonomic nerve system.

4—3 The application of *miso-compress* caused the intestinal rumbling noise at regular intervals in subject No.1 and it is of interest to observe the specific peak of blood flow ratio in close association with the borborygmus.

This was observed also in subject No.2 as well, but the specific peak was not detected; that may be due to individual variation.

Since the observed phenomena represent the function of intestine, it may be possibly to provide a new index for indication of the difference in state between the healthy and the paralyzed intestine.

The successive 5 week's application of *miso-compress* promoted the more frequent appearance of intense blood flow ratio peak, which shows the activation of intestinal functions.

4—4 For the better understanding of changes in circulation ability, trinomial repeated moving average, coefficient to represent the general condition of circulation ability was 40, a somewhat higher value than the real age, and further continued to rise upto 53 for 4 week's application.³⁾ (Figure-6)

At the end of 1 week after quitting the application, the coefficient rose to 61 and then again descended to return to the original point.

Correlated closely with this value is $-b/a$ which is in turn associated with stroke volume, while no change was observed in c/a and d/a . (Figure-7)

As of healthy subject No.1, the successive application of *miso*-compress seems to elevate the circulation ability and the quitting of application draws the circulation ability.

In subject No.2, the coefficient which indicates otherwise hardly observable circulation ability was obtained and this may be due to the adjustment by the application of *miso*-compress, the implication of which is still obscure.

4 — 5 Thirty subjects of normal health (age 23~70, 16 males, 14 females) assessed their perception gradings of efficacy of several day's application of *miso*-compress, the results of which were summarized in Figure-8.

About 50% of subjects acknowledged the effect of bowel movement, urination and sleep, while about 20% of subjects were not affected at all.

4 — 6 Six patients (23~63 years of age, 2 males & 4 females) who were hospitalized in *Koda Clinics* for receiving medical treatment of various diseases, recorded their perception of efficacy of several day's application of this therapy in qualitative gradings. (Figure-9)

Many hospitalized patients perceived the promotion of bowel movement by this therapy and all the patients acknowledged some perceptible effects.

In particular, it is noteworthy that some solid matter was found of fluid feces of the patients.

4 — 7 Summarized in Figure-10 are the results of quantities of feces and urine excreted by the healthy male subject (26 years of age) who was fed on same meals and the defined amount of water for 10 days.

The results show that the efficacy of *miso*-compress may be attribut-

ed to the water-adjusting ability in human body, thus largely affecting the excretion of feces and urine.

The changes of water-content in feces suggest that *miso*-compress possesses the feces-adjusting function so as to bring about the appropriate hardness of feces in the person with softness feces, while appropriate softness to the person with constipation.

It was recognized through 10 day's experiments of excretion that

- ① the intestinal peristalsis was perceived by subject, causing a natural feeling of excretion;
- ② the form of feces was optimized and became viscous after 10 days;
- ③ the frequency of urination during daytime became increased;
- ④ no feeling of urination was felt during the sleep to allow the sound sleep;
- ⑤ the amount of urine after morning rise increased. The frequency of urination during nocturnal sleep reduced lower as clinically found, which suggests the possibility of temporary efficacy of *miso*-compress on this case.

4—8 The skin irritant effect of the present *miso*-compress was tested for 34 subjects of normal health. (Figure-11)

The skin irritancy was not observed in abdomen at all, and a slightly red rash was found at upper-arm skin of one atopic subject which disappeared in one day, so that it may be concluded that the present *miso*-compress has no draw back of skin irritancy.

The person with sensitive skin often feels itchy on the local skin by the application of the conventional *miso*-compress in which *miso*-stuff is applied direct to the skin, while in the trial product newly developed by us, the contact of *miso*-stuff to the skin is indirect through unwoven clothings, thus greatly reducing the irritancy.

Reference

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Fig.1 The change of trinomial repeated moving average in subject No.1

Fig.3 The change of trinomial repeated moving average in subject No.2(II)

Fig.2 The change of trinomial repeated moving average in subject No.2(I)

Fig.4 The change of blood flow and intestinal peristalsis noise in subject No.2

Fig.5 The intensity of blood flow ratio and the frequency

Fig.8 Application for 30 normal health subjects

Fig.9 Application for 6 patients in hospitalized in Koda Clinics

Fig.6 The relationship between acceleration pulse wave and ages

Fig.10 Effects of quantities of feces and urine excreted by healthy male subject

Fig.7 The change of trinomial repeated moving average of acceleration pulse wave (subject No.1)

Fig.11 The skin irritant effect of miso-compress